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Public Health Education for Emergency Medicine Residents

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Abstract

Emergency medicine (EM) has an important role in public health, but the ideal approach for teaching public health to EM residents is unclear. As part of the national regional public health–medicine education centers-graduate medical education (RPHMEC-GM) initiative from the CDC and the American Association of Medical Colleges, three EM programs received funding to create public health curricula for EM residents. Curricula approaches varied by residency. One program used a modular, integrative approach to combine public health and EM clinical topics during usual residency didactics, one partnered with local public health organizations to provide real-world experiences for residents, and one drew on existing national as well as departmental resources to seamlessly integrate more public health–oriented educational activities within the existing residency curriculum. The modular and integrative approaches appeared to have a positive impact on resident attitudes toward public health, and a majority of EM residents at that program believed public health training is important. Reliance on pre-existing community partnerships facilitated development of public health rotations for residents. External funding for these efforts was critical to their success, given the time and financial restraints on residency programs. The optimal approach for public health education for EM residents has not been defined.

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Group authorship: MEB, CDT, NJ, RL and JF developed and evaluated the BIDMC RHMPEC-GME program. SLB directed the development and coordination of the Einstein RHMPEC-GME program. DG directed the initial development and coordination of the Brown RHMPEC-GME program. LS is currently the RHMPEC-GME program director at Brown. All authors participated in manuscript preparation.

Introduction

Over the past decades, EM's important place in public health has become clear, despite its core focus on stabilization and management of the acutely ill and injured.^{1, 2} Emergency departments have proved to be effective settings for disease surveillance and for a variety of screening and intervention programs for conditions such as HIV, falls, suicide, intimate partner violence, tobacco addiction, alcohol and drug abuse, chronic disease and injury^{3–17}. These public health–relevant activities, surveillance, screening, and intervention, were the subject of a 2009 conference convened by emergency physicians for emergency physicians, policymakers, and educators.¹⁸

At the same time, barriers exist to implementing public health programs in emergency departments, including increasing workload and financial pressures on emergency departments and the belief that preventive medicine approaches should be based in offices, public health departments and other non–emergency department sites¹⁹. As emergency physicians (EPs) work to define the role of public health in (over)stressed emergency departments, the importance of evidence-based public health becomes clear. To develop, evaluate and implement effective and efficient public health interventions, EPs need knowledge and tools in public health. Integration of these topics into EM residency curricula may be an ideal way to provide these skills while teaching residents about the interconnectedness of medicine and public health.

National guidance for EM residency training includes public health and prevention. In addition to guidelines from the Accreditation Council for Graduate Medical Education (ACGME), *The Model of the Clinical Practice of Emergency Medicine* (EM Model)²⁰ serves as the basis for the content specifications for all American Board of Emergency Medicine examinations and has been endorsed by the major EM professional societies and the Residency Review Committee (RRC) in EM. The EM Model recognizes “prevention and education” as a physician task, recommending physicians be able to “apply epidemiologic information to patients at risk; conduct patient education; [and] select appropriate disease and injury prevention techniques.” However, a cohesive curricular integration of public health into an emergency medicine postgraduate training program does not currently exist. What is unknown at this stage is how best to teach these skills to EM residents.

The Regional Medicine–Public Health Education Centers (RMPHEC) project, a collaborative effort of the Association of American Medical Colleges (AAMC) and the CDC, began in 2003 with pilot grants to seven medical schools. In 2008 the RMPHEC–graduate medical education (GME) program was launched to provide funding for public health training during residency. The RMPHEC and RMPHEC-GME aim to strengthen the relationship and increase the collaboration between academic medicine and public health. In 2008, 13 residency programs across the U.S. received funding for RMPHEC-GME programs. Of the grantees, three were EM residencies: the Harvard Affiliated Emergency Medicine Residency (HAEMR) at Beth Israel Deaconess Medical Center (BIDMC) in Boston, Massachusetts; the Jacobi-Montefiore Emergency Medicine Residency Program of the Albert Einstein College of Medicine (Einstein) in Bronx, New York.; and the Brown Alpert Medical School Emergency Medicine Residency Program (Brown) in Providence,

Rhode Island. (See Appendix A for program contact information.) While the initiatives shared a common goal—providing public health training for EM residents—their differing approaches offer useful insights for future efforts. This paper reviews and compares the three EM-based RMPHEC-GMEs and makes recommendations for other residencies wishing to incorporate additional public health content into their curricula.

Harvard-Affiliated Emergency Medicine Residency at Beth Israel Deaconess Medical Center (Boston, Massachusetts)

Public Health Curriculum Design

The BIDMC program used an integrative approach, combining core topics in public health with core topics in EM in a public health curriculum for residents at a 3-year EM program at a tertiary care hospital in Boston, Massachusetts. On July 1, 2008, the residency increased its program size from 33 to 35 residents. All EM residents were included in the didactic sessions unless excused for clinical duties.

The BIDMC RHMPEC-GME sought (1) to create a program that addresses the needs of residents and program directors, (2) to provide residents with the knowledge and skills to integrate public health principles into their practice of medicine, and (3) to integrate core public health principles into existing residency curricula. In order to address these goals, four public health sessions were held during regular resident didactic time over a period of 4 months (May to August, 2008). The curriculum was modular, with each public health core principle combined with a relevant clinical topic in EM. The majority of the curriculum changes occurred within the existing lecture schedule and with the use of existing residency and medical school faculty. The public health topics were the core competencies as defined by the Association of Schools of Public Health (ASPH): Biostatistics; Environmental Health Sciences (EHS); Epidemiology; Health Policy and Management (HPM); and Social and Behavioral Sciences (SBS)²¹. Residents attended four sessions: (1) anticoagulation and falls in the elderly (biostatistics and epidemiology); (2) violence within the emergency department (EHS); (3) the effect of healthcare reform on Massachusetts emergency departments (HPM); and (4) the use of brief interventions in the emergency department for alcohol abuse (SBS).

Future sessions will also use this modular framework; potential topics could combine stroke treatment with epidemiology, heat-related illness with EHS, or emergency department crowding with HPM. Each session included didactic and small-group components, and residents also attended a journal club discussion of papers concerning public health interventions in the emergency department and the relationship of EM and public health^{6, 19, 22–25}. In addition to these activities, residents had access to a course website (<http://www.publichealthed.com>), a library of purchased reference materials, and funding for public health research or quality improvement projects.

Program Evaluation—Prior to the first public health session, 20 residents participated in a structured focus group as a needs assessment to gain insight into their attitudes regarding public health practices in the emergency department, including what they felt was useful and

what was lacking. Before program implementation, all residents received an e-mail with a link to an online self-assessment. At the end of the program, residents completed the same online self-assessments. For both the pre- and post-implementation assessments, nonresponders received up to three additional reminder e-mails. Survey participation was voluntary, and this program review was determined to be exempt by the IRB at BIDMC.

The self-assessments included questions concerning: level of training; additional graduate degrees; postresidency plans (additional degree program; academic versus community medicine); rating of importance of public health to EM physicians; personal interest in public health, if any; comfort with the five public health disciplines; rating of residency program in relevant areas (teaching of public health principles relevant to clinical practice; teaching of skills to implement public health in clinical practice; integration of public health with clinical practice in the curriculum); frequency of use of public health principles in clinical practice; and opinion of public health in the curriculum and in EM as a field.

Data analysis included an unmatched comparison of pre- and post-assessment responses for each variable, and all statistical analyses were conducted at the BIDMC Department of Emergency Medicine using the software package Stata 8.0 (Stata Corporation, College Station, TX). For analysis, five category responses (ranked 1–5, with 1 defined as “not at all” or “very poorly”, 3 as “neutral”, and 5 as “very much” or “very well”) were collapsed into three categories (“no”, “neutral”, “yes”). Counts and proportions were calculated and Pearson chi-square analysis was used to test for differences in responses before and after program implementation.

Outcomes

Twenty-nine of 33 residents (88%) completed the pre-program assessment in April, 2008, and 22 of 35 residents (63%) completed the post-program assessment in October, 2008. Response rates did not vary significantly by current level of residency training. After the public health curriculum, seven residents reported plans to obtain a Masters in Public Health degree as compared to five residents prior. After implementation, an increased proportion of residents (23%) felt the residency had taught them public health skills (vs 10% before implementation; $p<0.05$, Table 1). There was a significant change in reported familiarity with public health after the curriculum, with a decrease in the proportions of those unfamiliar and familiar (14% vs 31%, in both cases) and an increase in the proportion who gave a neutral response (68% vs 35%; $p<0.05$, Table 1). The shift toward a neutral response may reflect how the introduction to public health may have unmasked the need to learn even more about public health.

After program implementation, fewer residents reported unfamiliarity with biostatistics (9% vs 38% before) and environmental health sciences (32% vs 45% before), and more reported familiarity with those subjects (23% vs 14% before for biostatistics; 18% vs 14% before for environmental health sciences), although these changes were not significant (Table 2). Residents seemed most interested in learning about public health topics in health policy and management, with a majority reporting interest both before (59%) and after (64%, Table 2).

Familiarity with and interest in the core public health disciplines did not vary by level of residency training (data not shown).

The BIDMC RHMPEC-GME program continues. Based on feedback from the residents and faculty, the program and the modules have been revised and integrated into the residency curriculum in a more longitudinal format in order to demonstrate that public health is a fundamental part of everyday emergency medicine.

Jacobi-Montefiore Emergency Medicine Residency Program of the Albert Einstein College of Medicine (Bronx, New York)

The goal of the Einstein RMPHEC-GME is to use a combination of classroom and field learning experiences to enhance the education of residents in (1) public health, (2) population health, (3) prevention, and (4) the role of physicians in public health promotion. The program educates 72 residents in the 4-year EM program, and 54 in the 3-year Residency Program in Social Medicine, a specialized track involving trainees in internal medicine, family medicine, and pediatrics. A unique aspect of this program is the intent to have EM residents benefit from the population health curriculum components that are part of the Social Medicine residency, and to have Social Medicine residents participate in some of the public health-oriented activities that are part of EM training.. Didactic components add about 3 hours/year of new material to both programs, and are taught by existing faculty, typically from emergency and family medicine.

The structure, focus, and educational content of the Bronx RMPHEC-GME is heavily informed by the Clinical Prevention and Population Health Curriculum Framework developed by the Healthy People Curriculum Task Force, and the IOM's report, *Training Physicians for Public Health Careers*²⁶. The center emphasizes educating residents about the social, behavioral, and environmental determinants of health in the Bronx, a borough of 1.4 million and the nation's poorest urban county.

Experiential curricula are given particular emphasis in the Einstein RMPHEC-GME and utilize already-existing rotations and relationships among Einstein local partners. The clinical homes are Montefiore Medical Center and Jacobi Medical Center, two urban teaching hospitals and integrated delivery systems with large ambulatory care networks located in the Bronx, New York. Einstein, Montefiore, and Jacobi have rich traditions of caring for medically underserved populations. Studying healthcare disparities and disparities reduction has been a focus of these institutions and the RMPHEC-GME investigators.

Einstein's RMPHEC-GME partnered with the New York City Department of Health and Mental Hygiene (DOHMH) and its Bronx District Public Health Office to create a 4-week elective rotation for interested residents. Einstein and the DOHMH have collaborated on various projects for years, and the RMPHEC-GME represented a natural extension of these activities. Residents at the district health office participate in inspections of restaurants and public housing, surveillance for infectious diseases, and maternal health. The Bronx RMPHEC-GME has also partnered with the New York City Poison Control Center, the Fire Department of New York/Emergency Medical Services, and the Office of the Chief Medical

Examiner. All offer rotations for residents; for the Social Medicine trainees, these represent new curricular experiences. For the EM residents, the poison center and EMS experiences are required by the EM RRC. The Bronx Regional Health Information Organization is offering a new rotation in clinical information systems and health information exchange.

In 2008, the Einstein RMPHEC-GME delivered to EM residents a 1-hour lecture on the public health function of emergency departments, presented by the RMPHEC-GME program director, and a 1-hour lecture on population health characteristics of the Bronx, presented by the New York City DOHMH Assistant Commissioner for the Bronx District Public Health Office. Ten EM residents also volunteered to complete an early version of an online course in death certificate completion that was developed by the DOHMH. Based on strongly positive feedback from the EM residents, this course is being revised and will eventually be offered to residents in all specialties in New York City. The RMPHEC-GME program provided textbooks in toxicology, public health, and epidemiology for both residencies' libraries.

The Principal Investigator for the Einstein RMPHEC has since moved to Yale, where he has created a residency track in public health that includes many of the same curricular experiences described, along with additional modules that include: site visits to a local community health center, exercises in geospatial modeling of injury and substance use, participation in active research projects involving interventions for patients with substance use disorders, and meetings with community-based organizations. Planned evaluation approaches include written surveys of residents and postresidency tracking of graduates to record additional training (e.g., fellowships or degree-granting programs) in public health or global health.

Brown Emergency Medicine Residency Program (Providence, Rhode Island)

The initial goal at the Brown RMPHEC-GME was to better elucidate the core content in public health and prevention appropriate for different levels of training in EM. A working group consisting of faculty with expertise in public health and prevention and GME education from the Brown EM Program, representatives from the Rhode Island Department of Health, the Director of the Brown University Program in Public Health, Brown EM residents, and local community workers planned to (1) review and research existing competency models, curricula, and guidelines for public health training for emergency physicians; (2) identify local and regional resources for experiential activities in public health; (3) develop a resource guide that defines core competencies in public health for emergency medicine GME training; and (4) outline basic educational principles and models for integrating these competencies into existing EM GME training.

Due to a change in principal investigator and departmental limitations in time and resources, the original plan was modified when the new principal investigator took over the program in the summer of 2009. In order to maximize their impact with the remaining time and funds, efforts were shifted toward identifying and taking advantage of opportunities for increased public health education within the existing resources of the Brown EM residency. After this

shift, the RHMPEC-GME activities at Brown effectively and seamlessly introduced more public health education within an existing curriculum on relatively short notice within a defined budget.

Specific activities that were developed and implemented at Brown under the RHMPEC-GME (in addition to already existing residency education activities in the area of biostatistics and public health) have included:

1. Public health–oriented Grand Rounds speakers series as part of the mandated residency conference curriculum: Seven speakers from across the U.S. and from Rhode Island state public health agencies have given presentations to date. Speakers have addressed injury prevention and brief interventions for behavior modification in the emergency department, emerging infectious diseases, public health ethics, challenges and opportunities of doing public health research in EM, issues of health policy in Rhode Island, and the future of acute care medicine in the U.S. Feedback from the audience has been positive; more than three quarters of the presentations have been rated as “excellent” (highest rating on 5-point Likert scale) by more than 80% of evaluation respondents.
2. Development of public health–related simulation cases: The Brown EM residency has a very active medical simulation program (<http://www.rhodeislandhospital.org/rih/services/simctr/>), and residents undergo frequent simulation experiences in the Brown Emergency Medicine Simulation Center in their mandated residency conference curriculum. The RHMPEC-GME supported the development and implementation of three new public health–oriented simulation cases by Brown EM faculty: (1) emerging infectious disease among recent immigrants; (2) alcohol abuse recognition and brief emergency department intervention; and (3) pediatric motor vehicle accident and child safety restraints. Participant feedback indicates that they were well received, and that they increased knowledge in these three public health–related areas. The simulation cases will become part of the routine simulation curriculum rotation of the EM residency and may also be used in simulation workshops for other groups.
3. Partnership with the Rhode Island Free Clinic (RIFC) to develop smoking cessation program for their clients: An existing relationship between the Brown Department of EM and the RIFC facilitated an opportunity to collaborate on developing a self-sustaining intervention to promote smoking cessation for RIFC clients using existing RIFC resources. Three residents participated in this project, and not only gained valuable experience in the development and implementation of a public health–oriented project, but also met the core residency requirements of a scholarly project and/or continuous quality improvement project.
4. Development of a youth violence recognition and prevention module for EM providers: Building on the injury prevention expertise within the Brown Department of EM a group of faculty and residents are developing a 30-minute Internet-based educational module and a 10-minute “booster” module to help resident physicians recognize and address youth violence in the emergency department. Before-and-after surveys of residents about youth violence knowledge,

behavior, and attitude as well as rate of use of specifically developed violence prevention discharge will be used to assess the effectiveness of the intervention. If the educational module proves effective it will also be incorporated into the routine training activities of the residency program.

5. Special public health-oriented residency events: An intern orientation scavenger hunt was held in 2008 including public health challenges such as: “Go to a grocery store and price out the cost of 1 pack of cigarettes a day”; “List all the liquor stores within 0.5 miles of the ED”; “Fill out hospital paperwork for community free service”; and “Name 3 community service agencies and the services that they provide for our ED clients”. A community service day for residents was held on the last day of residency conference and included planting a garden to beautify a local homeless shelter in partnership with the shelter residents. Materials to conduct a 5-hour poverty simulation were purchased for the residency; they are to be used in future intern orientation activities.²⁷

Discussion

Both clinical and nonclinical medical professionals have begun to understand the potential for improving patient health that can be achieved by integrating medicine with basic principles of public health. Indeed, a report published by the IOM in 2007 stressed the need for more effective communication between public health officials and physicians, citing the drastic improvements in health and average life-span made by past collaborations such as vaccination programs²⁶.

EM as a field has an important role in public health: an emergency department visit may be a patient's only contact with the medical system; emergency department patients with acute injuries or illnesses—so-called “teachable moments”—may be more open to behavioral change²⁹; and emergency departments may represent an ideal site for screening and intervention for certain public health problems^{22, 24, 30, 31}. Emerging areas in which EM and public health are intimately tied together include international EM, disaster and bioterrorism preparedness and relief, patient safety, public health ethics, end-of-life care³², and providing health services for under-represented and marginalized communities. In 2000, the Society for Academic Emergency Medicine's Public Health and Education Task Force generated a preliminary list of preventive activities that could be studied for emergency department implementation³³. However, the myriad financial, time and personnel pressures on emergency departments require that evidence-based approaches be used when developing and implementing public health interventions. Augmenting EM residents' knowledge of evidence-based public health practices and providing them with the tools to implement that understanding presents an efficient means of integrating EM and public health.

There are several important limitations to consider when interpreting these programs' results. At BIDMC and Brown, the pre- and post-tests assessments were voluntary, and a substantial minority of residents did not respond or declined participation. Although overall resident attendance at weekly didactic conferences is high, the varying rotation and shift schedules mean that many residents may have missed one or more of the public health

sessions and the relatively small sample size limited the power of the analyses. Since these were unmatched analyses, they had limited ability to examine change in the attitudes of individual residents exposed to the curriculum. The program evaluations also did not test the residents' knowledge of public health principles after the curriculum, so the amount of knowledge gained is unknown.

Each of the programs RHMPEC-GME described was developed at a teaching hospital in a large east coast city, and the results may not be generalizable to the larger population of EM residents. The Einstein program benefited from pre-existing relationships with public health partners that may not exist in other cities or more rural areas. At all three sites, the RHMPEC-GME centers are in the first stage of development, so feedback and objective outcomes are limited. Funding for these programs is modest, and contingent on annual CDC appropriations. A specific challenge will be to sustain RMPHEC-GME activities beyond the life of the extramural support.

The ideal approach for teaching public health to EM residents remains unclear, and the described RMPHEC-GME programs are in the early stage of development. Success at a particular residency program will likely result from a blended program tailored to the particular needs of its residents and emergency department population. However, early experiences of the current authors with the RMPHEC-GME program led to a few general recommendations:

- *Address the needs of residents and residency directors.* Residency directors and residents face substantial time and academic demands, and any additions to curricula may be perceived as unwanted and unnecessary. A modular approach like the one used at BIDMC, which combined clinical EM topics and public health principles, fulfilled EM curriculum requirements while showing residents the natural linkage between public health and medicine. Pre-implementation focus groups with residents highlighted particular areas of interest and concern, and resident feedback was used to refine sessions.
- *Minimize additional time demands in order to maximize program acceptance.* As mentioned above, residency directors face the challenge of teaching residents a large amount of material in limited protected time for didactics. Integration of public health topics into existing residency structures—such as regular didactic sessions, simulation experiences, electives or journal clubs—minimizes resident or faculty rejection and helps legitimize public health topics as relevant to EM. Use of a modular curriculum design like BIDMC's or an integrative design such as at Brown facilitates maintenance and dissemination of the curriculum in the future, as new clinical topics could easily be linked with the core public health principles.
- *Work with community partners to make public health real and relevant.* The Einstein RHMPEC-GME program partnered with local government offices such as the DOHMH and the Medical Examiner to develop resident rotations and didactic sessions. Such experiential learning allows residents to witness public health in action and exposes them to potential career options and research collaborations outside of their immediate hospital environment. These partnerships can also

increase community acceptance of emergency department–based interventions and may provide residencies with alternative sources of funding.

- *Focus on core topics in public health.* As a field, EM should develop a public health addendum to the EM Model²⁰ to guide residencies, emergency department administrators, and individual Emergency Physicians. As EM continues to mature as a specialty, and as it faces increasing challenges from the aging population and limited access to care, the field will need to clarify its role in public health. Rather than reacting to public health mandates from external sources, EM should define its own agenda for public health research, emergency department–based interventions, and education. Due to unexpected circumstances, the Brown RMPHEC-GME program has not been able to develop emergency medicine–oriented core competencies in public health as originally planned. However, the need for a theoretic framework for public health education in emergency medicine still exists. Defining distinct competency levels helps to overcome the barriers to integrating new curricular competencies by allowing program directors or residents to pick the level of competencies they are able to integrate across different areas of public health. Modular competencies also allow for a staged integration into a curriculum, allowing a program director to integrate one subtopic at a time if need be. The difficulty of developing a public-health core competency framework within the confines of one academic institution may serve as impetus to take the task of developing such a framework to the national level (e.g., as part of the educational efforts of professional societies in emergency medicine).

Conclusion

Public health has become an increasingly important aspect of EM and therefore deserves a place in EM residency curriculum. The best way to implement public health curriculum in an already busy didactic schedule is unclear. Effective strategies may include pre-implementation formal needs assessments through resident focus groups, tying the lecture to real world cases so the residents can grasp the connection with their current practice, and partnering with public health organizations to give residents “real-world” experiences. Curricula should be evaluated, including testing of resident knowledge base and concrete outcomes such as resident-driven public health projects based in the emergency department or changes in emergency department practice patterns. EM as a field should work to further define its role in public health research, education and emergency department–based interventions and should develop a set of tiered competencies in public health for EM.

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Section: Educational Advances

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References

1. Bernstein E, Goldfrank LR, Kellermann AL, et al. A public health approach to emergency medicine: preparing for the twenty-first century. *Acad Emerg Med*. 1994; 1:277–286. [PubMed: 7621210]
2. Pollock DA, Lowery DW, O'Brien PM. Emergency medicine and public health: new steps in old directions. *Ann Emerg Med*. 2001; 38:675–683. [PubMed: 11719749]
3. Bernstein E, Goldfrank LR, Kellerman AL, et al. A public health approach to emergency medicine: preparing for the twenty-first century. *Acad Emerg Med*. 1994 May-Jun;1(3):277–286. [PubMed: 7621210]
4. Mehta SD, Hall J, Lyss SB, et al. Adult and pediatric emergency department sexually transmitted disease and HIV screening: programmatic overview and outcomes. *Acad Emerg Med*. 2007 Mar; 14(3):250–258. [PubMed: 17331918]
5. Krasnoff M, Moscatti R. Domestic violence screening and referral can be effective. *Ann Emerg Med*. 2002 Nov; 40(5):485–492. [PubMed: 12399791]
6. The impact of screening, brief intervention, and referral for treatment on emergency department patients' alcohol use. *Ann Emerg Med*. 2007 Dec; 50(6):699–710. 710 e691–710 e696. [PubMed: 17870206]
7. Lowenstein SR, Weissberg MP, Terry D. Alcohol intoxication, injuries, and dangerous behaviors--and the revolving emergency department door. *J Trauma*. 1990 Oct; 30(10):1252–1258. [PubMed: 2213933]
8. Lowenstein SR, Tomlinson D, Koziol-McLain J, et al. Smoking habits of emergency department patients: an opportunity for disease prevention. *Acad Emerg Med*. 1995 Mar; 2(3):165–171. [PubMed: 7497028]
9. Prochazka A, Koziol-McLain J, Tomlinson D, et al. Smoking cessation counseling by emergency physicians: opinions, knowledge, and training needs. *Acad Emerg Med*. 1995 Mar; 2(3):211–216. [PubMed: 7497036]
10. Babcock Irvin C, Wyer PC, Gerson LW. Preventive care in the emergency department, part II: clinical preventive services--an emergency medicine evidence-based review. Society for Academic Emergency Medicine Public Health and Education Task Force Preventive Services Work Group. *Acad Emerg Med*. 2000 Sep; 7(9):1042–1054. [PubMed: 11044002]
11. Hunt DK, Lowenstein SR, Badgett RG, et al. Safety belt nonuse by internal medicine patients: a missed opportunity in clinical preventive medicine. *Am J Med*. 1995 Apr; 98(4):343–348. [PubMed: 7709946]
12. Abbott J, Johnson R, Koziol-McLain J, et al. Domestic violence against women. Incidence and prevalence in an emergency department population. *JAMA*. 1995 Jun 14; 273(22):1763–1767. [PubMed: 7769770]
13. Feldhaus KM, Koziol-McLain J, Amsbury HL, et al. Accuracy of 3 brief screening questions for detecting partner violence in the emergency department. *Jama*. 1997 May 7; 277(17):1357–1361. [PubMed: 9134940]
14. Lowenstein SR, Koziol-McLain J, Thompson M, et al. Behavioral risk factors in emergency department patients: a multisite survey. *Acad Emerg Med*. 1998 Aug; 5(8):781–787. [PubMed: 9715239]
15. Koziol-McLain J, Coates CJ, Lowenstein SR. Predictive validity of a screen for partner violence against women. *Am J Prev Med*. 2001 Aug; 21(2):93–100. [PubMed: 11457628]
16. Houry D, Feldhaus K, Peery B, et al. A positive domestic violence screen predicts future domestic violence. *J Interpers Violence*. 2004 Sep; 19(9):955–966. [PubMed: 15296611]
17. Ginde AA, Cagliero E, Nathan DM, et al. Point-of-care Glucose and Hemoglobin A1c in Emergency Department Patients without Known Diabetes: Implications for Opportunistic Screening. *Acad Emerg Med*. 2008 Sep 8.

18. Bernstein SL, D'Onofrio G. Public Health in the Emergency Department: Academic Emergency Medicine Consensus Conference Executive Summary. *Academic Emergency Medicine*. 2009; 16(11):1037–1039. [PubMed: 20053218]
19. Kelen GD. Public health initiatives in the emergency department: not so good for the public health? *Acad Emerg Med*. 2008 Feb; 15(2):194–197. [PubMed: 18275451]
20. The Model of the Clinical Practice of Emergency Medicine. American Board of Emergency Medicine. Available at: https://www.abem.org/public/_Rainbow/Documents/2007%20EM%20Model.pdf.
21. Public Health Competencies. Association of Schools of Public Health. Available at: <http://www.asph.org/document.cfm?page=929>.
22. Bernstein SL, Haukoos JS. Public health, prevention, and emergency medicine: a critical juxtaposition. *Acad Emerg Med*. 2008 Feb; 15(2):190–193. [PubMed: 18275450]
23. Tanabe P, Persell SD, Adams JG, et al. Increased blood pressure in the emergency department: pain, anxiety, or undiagnosed hypertension? *Ann Emerg Med*. 2008 Mar; 51(3):221–229. [PubMed: 18207606]
24. Gaddis GM, Hauswald M. The provision of public health services in the emergency department: "begin with the end in mind". *Acad Emerg Med*. 2008 Feb; 15(2):198–200. [PubMed: 18275453]
25. Al-Tayyib AA, Miller WC, Rogers SM, et al. Evaluation of risk score algorithms for detection of chlamydial and gonococcal infections in an emergency department setting. *Acad Emerg Med*. 2008 Feb; 15(2):126–135. [PubMed: 18275441]
26. Hernandez, LM.; Munthali, AW. Training physicians for public health careers. Washington DC: IOM of the National Academies; 2007.
27. Community Pediatrics Curriculum. American Association of Pediatrics. Available at: <http://www.aap.org/commpeps/CPTI/resources.htm>.
28. Denninghoff KR, Knox L, Cunningham R, et al. Emergency medicine: competencies for youth violence prevention and control. *Acad Emerg Med*. 2002 Sep; 9(9):947–956. [PubMed: 12208685]
29. Mello MJ, Nirenberg TD, Longabaugh R, et al. Emergency department brief motivational interventions for alcohol with motor vehicle crash patients. *Ann Emerg Med*. 2005 Jun; 45(6):620–625. [PubMed: 15940095]
30. Bernstein SL, Bernstein E, Boudreaux ED, et al. Public health considerations in knowledge translation in the emergency department. *Acad Emerg Med*. 2007 Nov; 14(11):1036–1041. [PubMed: 17699805]
31. Pollock DA, Lowery DW, O'Brien P M. Emergency medicine and public health: new steps in old directions. *Ann Emerg Med*. 2001 Dec; 38(6):675–683. [PubMed: 11719749]
32. Marco CA, Schears RM. Death, dying, and last wishes. *Emerg Med Clin North Am*. 2006 Nov; 24(4):969–987. [PubMed: 16982348]
33. Rhodes KV, Gordon JA, Lowe RA. Preventive care in the emergency department, Part I: Clinical preventive services--are they relevant to emergency medicine? Society for Academic Emergency Medicine Public Health and Education Task Force Preventive Services Work Group. *Acad Emerg Med*. 2000 Sep; 7(9):1039–1041.

Appendix A

Current Regional Medicine–Public Health Education Centers–Graduate Medical Education Emergency Medicine Project Contacts

Harvard Affiliated Emergency Medicine Residency at Beth Israel Deaconess Medical Center: Jonathan Fisher, MD, MPH, jfisher2bidmc.harvard.edu

Jacobi-Montefiore Emergency Medicine Residency Program of the Albert Einstein College of Medicine: Steven L. Bernstein, MD (Currently at Yale), steven.bernsteinyale.edu

Brown Emergency Medicine Residency Program: Lisa Schweigler, MD, MPH, MS,
Lschweiglerlifespan.org

AAMC: [https://www.aamc.org/initiatives/cdc/aamcbased/rmphec/64936/
rmphec_grantees.html](https://www.aamc.org/initiatives/cdc/aamcbased/rmphec/64936/rmphec_grantees.html)

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Table 1

Resident attitudes toward public health before and after curriculum implementation in the HAEMR program at BIDMC, Boston, MA, 2008

		BEFORE (N=29)		AFTER (N=22)	
		n	%	n	%
Plan to obtain MPH		5	17.2	7	31.8
Anticipated type of career in Emergency Medicine *	Academic	16	55.2	3	13.6
	Community	9	31.0	5	22.7
	Undecided	4	13.8	14	63.6
Important that physicians receive training in public health?	No	1	3.4	1	4.5
	Yes	22	75.9	16	72.7
Personal interest in public health	Yes	19	65.5	11	50.0
Familiar with Public Health in general *	No	9	31.0	3	13.6
	Neutral	10	34.5	15	68.2
	Yes	9	31.0	3	13.6
	Missing	1	3.4	1	4.5
Interest in learning Public Health in general	No	4	13.8	1	4.5
	Neutral	6	20.7	9	40.9
	Yes	18	62.1	11	50.0
	Missing	1	3.4	1	4.5
Public Health principles are taught in residency	No	7	24.1	1	4.5
	Neutral	13	44.8	14	63.6
	Yes	6	20.7	6	27.3
	Missing	3	10.3	1	4.5
Public Health skills are taught in residency *	No	10	34.5	1	4.5
	Neutral	13	44.8	15	68.2
	Yes	3	10.3	5	22.7
	Missing	3	10.3	1	4.5
Residency addresses clinical needs	No	1	3.4	0	0.0
	Neutral	5	17.2	6	27.3

		BEFORE (N=29)		AFTER (N=22)	
		n	%	n	%
	Yes	20	69.0	15	68.2
	Missing	3	10.3	1	4.5
Residency addresses public health needs	No	4	13.8	0	0.0
	Neutral	14	48.3	16	72.7
	Yes	8	27.6	5	22.7
	Missing	3	10.3	1	4.5
Public health is integrated into the residency	No	7	24.1	1	4.5
	Neutral	14	48.3	14	63.6
	Yes	5	17.2	5	22.7
	Missing	3	10.3	2	9.1
Amount of public health in residency curriculum	too little	14	48.3	6	27.3
	just enough	12	41.4	13	59.1
	too much	0	0.0	2	9.1
	missing	3	10.3	1	4.5
Amount of public health in Emergency Medicine	too little	11	37.9	11	50.0
	just enough	13	44.8	9	40.9
	too much	2	6.9	1	4.5
	missing	3	10.3	1	4.5

* Significant at P<0.05 under Pearson χ^2 analysis

BIDMC, Beth Israel Deaconess Medical Center; HAEEMR, Harvard Affiliated Emergency Medicine Residency

Resident familiarity with and interest in specific public health topics before and after curriculum implementation in the HAEMR program at BIDMC, Boston, MA, 2008

Table 2

		BEFORE (N=29)		AFTER (N=22)	
		n	%	n	%
Familiar with Biostatistics	No	11	37.9	2	9.1
	Neutral	13	44.8	14	63.6
	Yes	4	13.8	5	22.7
	Missing	1	3.4	1	4.5
Familiar with Environmental Health Sciences	No	13	44.8	7	31.8
	Neutral	11	37.9	10	45.5
	Yes	4	13.8	4	18.2
	Missing	1	3.4	1	4.5
Familiar with Epidemiology	No	11	37.9	4	18.2
	Neutral	9	31.0	13	59.1
	Yes	8	27.6	4	18.2
	Missing	1	3.4	1	4.5
Familiar with Health Policy and Management	No	7	24.1	7	31.8
	Neutral	13	44.8	8	36.4
	Yes	8	27.6	6	27.3
	Missing	1	3.4	1	4.5
Familiar with Social and Behavioral Sciences	No	7	24.1	1	4.5
	Neutral	7	24.1	12	54.5
	Yes	13	44.8	7	31.8
	Missing	1	3.4	2	9.1
Interest in learning Biostatistics	No	6	20.7	2	9.1
	Neutral	8	27.6	9	40.9
	Yes	14	48.3	9	40.9
	Missing	1	3.4	2	9.1

		BEFORE (N=29)		AFTER (N=22)	
		n	%	n	%
Interest in learning Environmental Health Sciences	No	8	27.6	6	27.3
	Neutral	11	37.9	7	31.8
	Yes	9	31.0	8	36.4
Interest in learning Epidemiology	Missing	1	3.4	1	4.5
	No	6	20.7	4	18.2
	Neutral	7	24.1	10	45.5
	Yes	15	51.7	7	31.8
	Missing	1	3.4	1	4.5
Interest in learning Health Policy and Administration	No	4	13.8	2	9.1
	Neutral	7	24.1	5	22.7
	Yes	17	58.6	14	63.6
Interest in learning Social and Behavioral Sciences	Missing	1	3.4	1	4.5
	No	3	10.3	2	9.1
	Neutral	10	34.5	10	45.5
	Yes	15	51.7	9	40.9
	Missing	1	3.4	1	4.5